

## Ecosystem Components

### Levels of Organization

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#### Ecology

the study of the interactions between organisms and their environment

Organisms interact with living (biotic) and nonliving (abiotic) components of their environment

Biotic factors

- trees
- humans
- grass
- animals

Abiotic factors

- water
- soil
- sun
- temperature
- nutrients

Biotic and abiotic factors are NOT independent

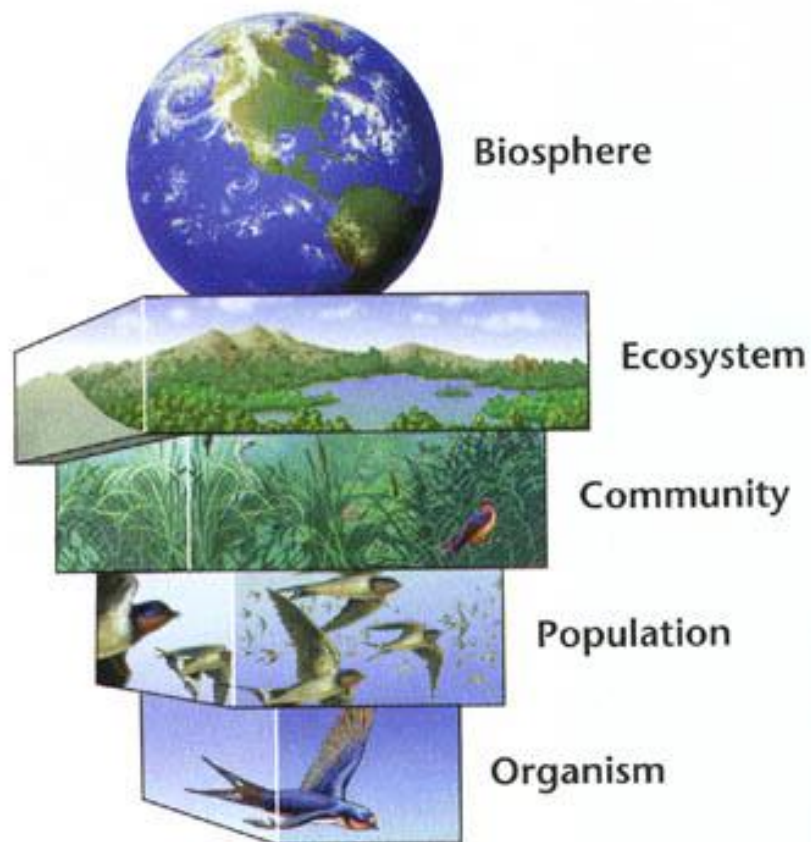


Organisms change their environment and are influenced by those changes

Example: the availability of nitrogen in the soil affects how fast plants can grow, and plants affect nitrogen availability by absorbing nitrogen from the soil

Levels of organization

a hierarchy of organization in the environment



Biosphere

the outer portion of Earth where life is found

Includes air, water and soil

It extends from the atmosphere to the deepest part of the oceans

## Ecosystem

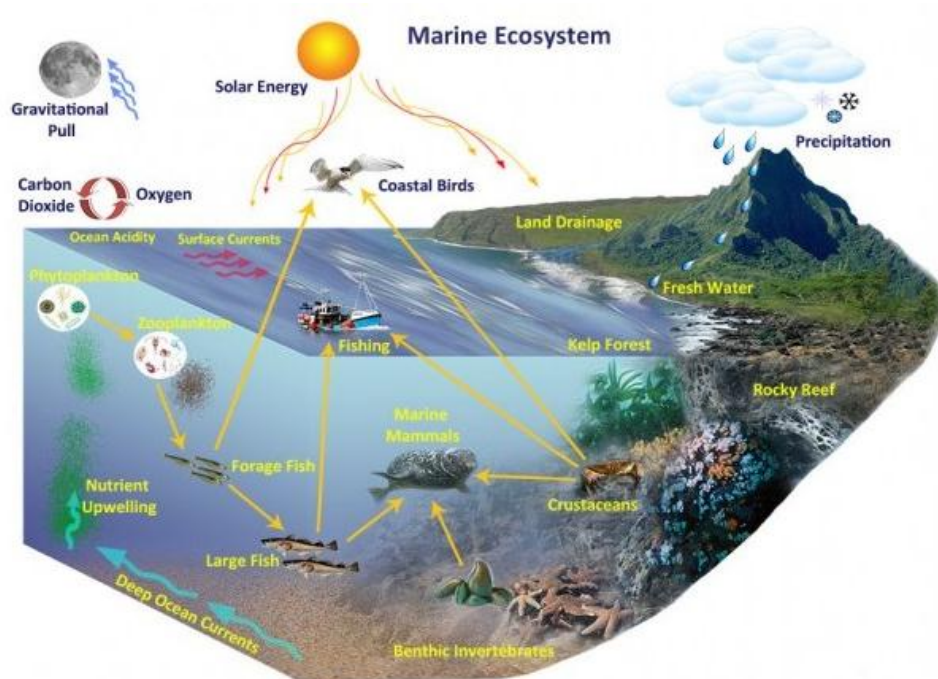
all the organisms and the nonliving environment in a specific place

The organisms interact with each other and their environment in ways that affect their survival

Examples:

- pond
- rainforest
- aquarium
- desert
- garden

<http://www.brainpop.com/science/ecologyandbehavior/ecosystems/>



[http://media.wwnorton.com/college/biology/discoverbio5/common/24\\_01/start.html](http://media.wwnorton.com/college/biology/discoverbio5/common/24_01/start.html)

## **Community**

all the organisms that live and interact in a particular area

May contain thousands of species



## **Population**

includes all the members of a species that live in the same place at the same time



Organism

the simplest level of organization  
in ecology



## Ecosystem Components

### Energy Transfer

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#### Producer

organism that makes its own food

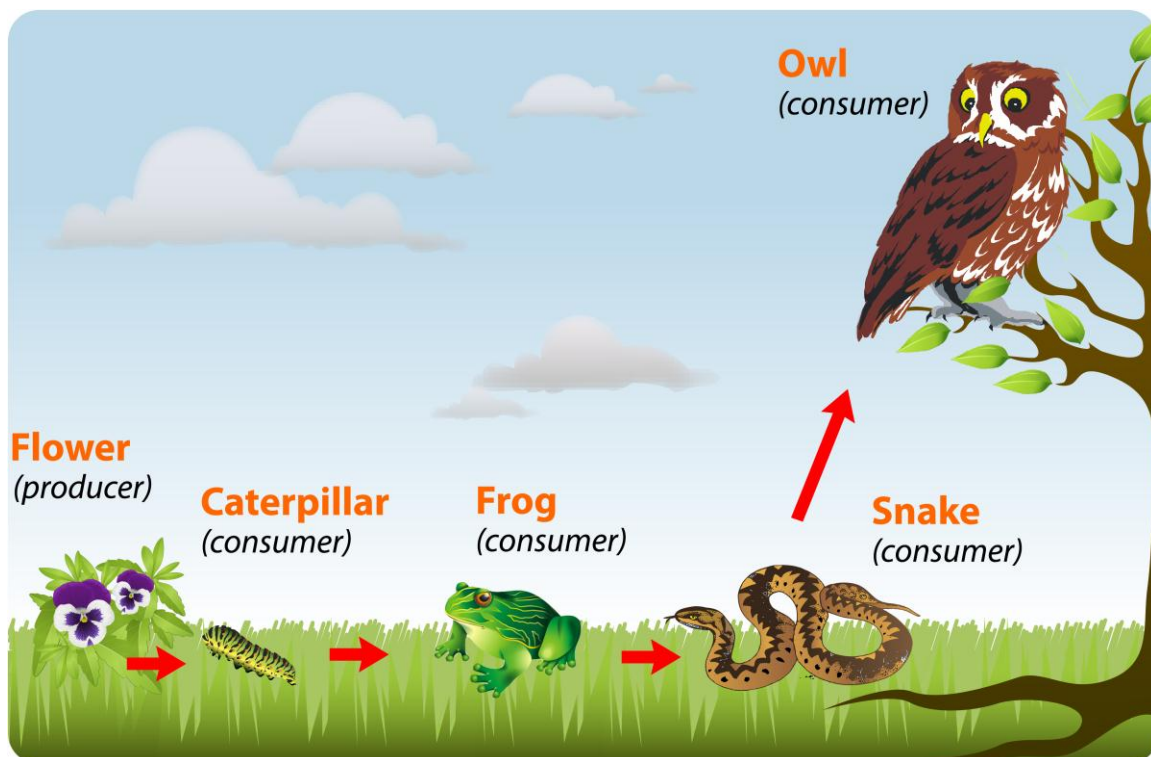
Autotrophs (plants and some protists) are producers

#### Consumer

an organism that feeds on other organisms

Heterotrophs are consumers

Consumers eat producers and other consumers



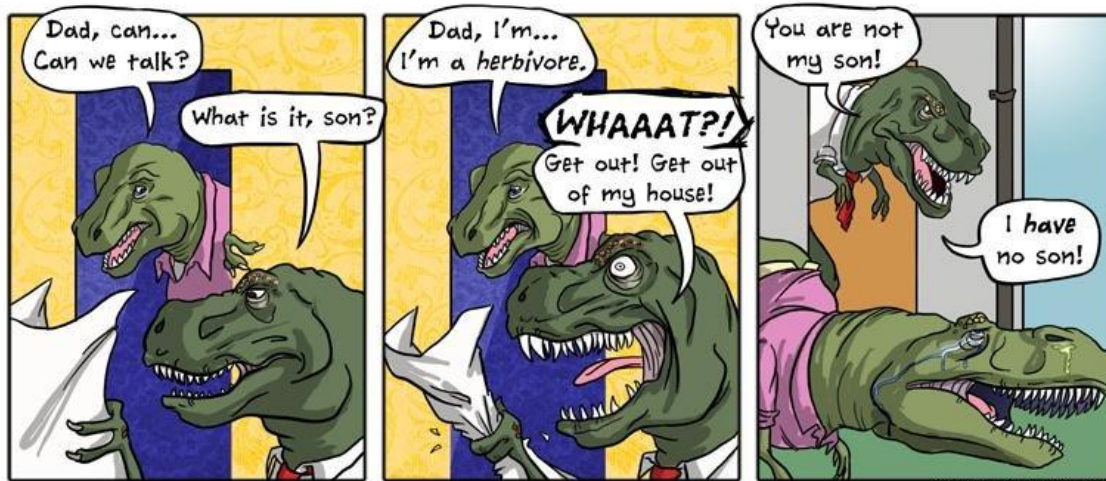
## Consumers

are grouped according to the type of food they eat

- herbivores
- carnivores
- omnivores
- detritivores

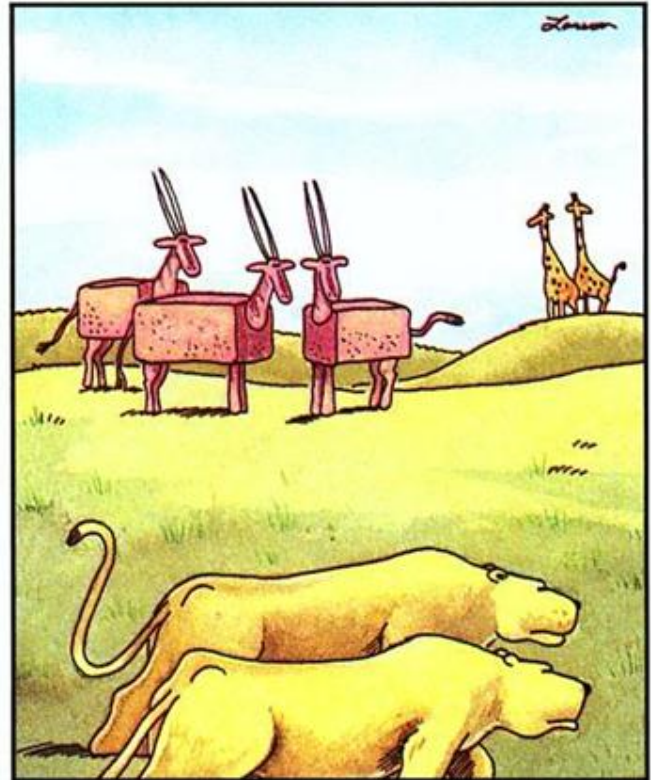
## Herbivore

a consumer that eats producers (plant-eater)



## Carnivore

a consumer that eats other consumers (meat-eater)



Knowing the lion's preference for red meat, the spamalopes remained calm but wary.

## Omnivore

a consumer that eats producers and consumers

## Detritivore

a consumer that feeds on the detritus ("garbage") of an ecosystem

Examples of detritus:

- organisms that have recently died
- fallen leaves
- animal waste



Examples of  
detritivores

- vultures
- bacteria
- fungi

## Decomposer

a type of detritivore that causes decay by breaking down complex molecules into simpler molecules (bacteria, fungi)

Decomposers make nutrients from detritus available again to autotrophs in the ecosystem

Energy flow in  
an ecosystem

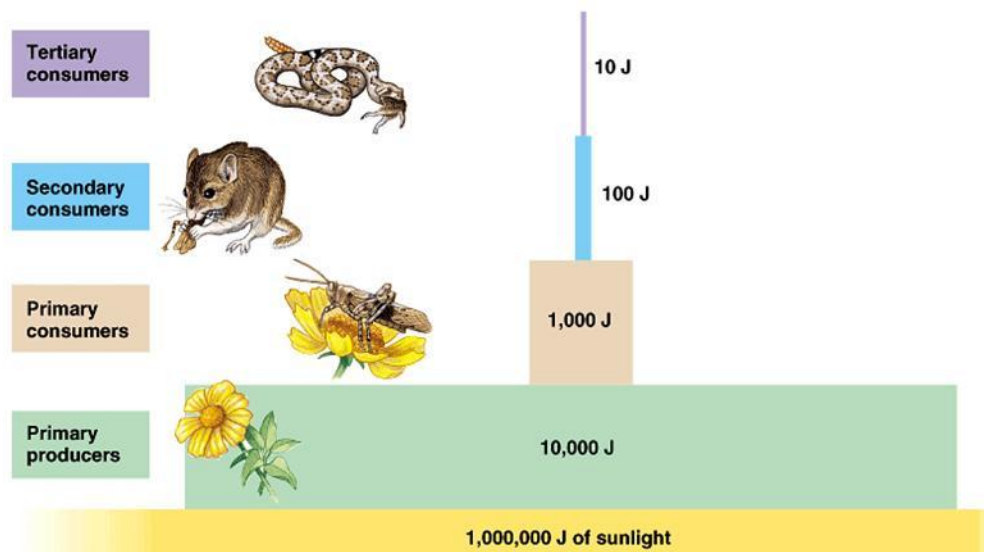
moves from producers to  
consumers

## Trophic level

an organism's position in a food  
chain

Producers

are always at the bottom/first level



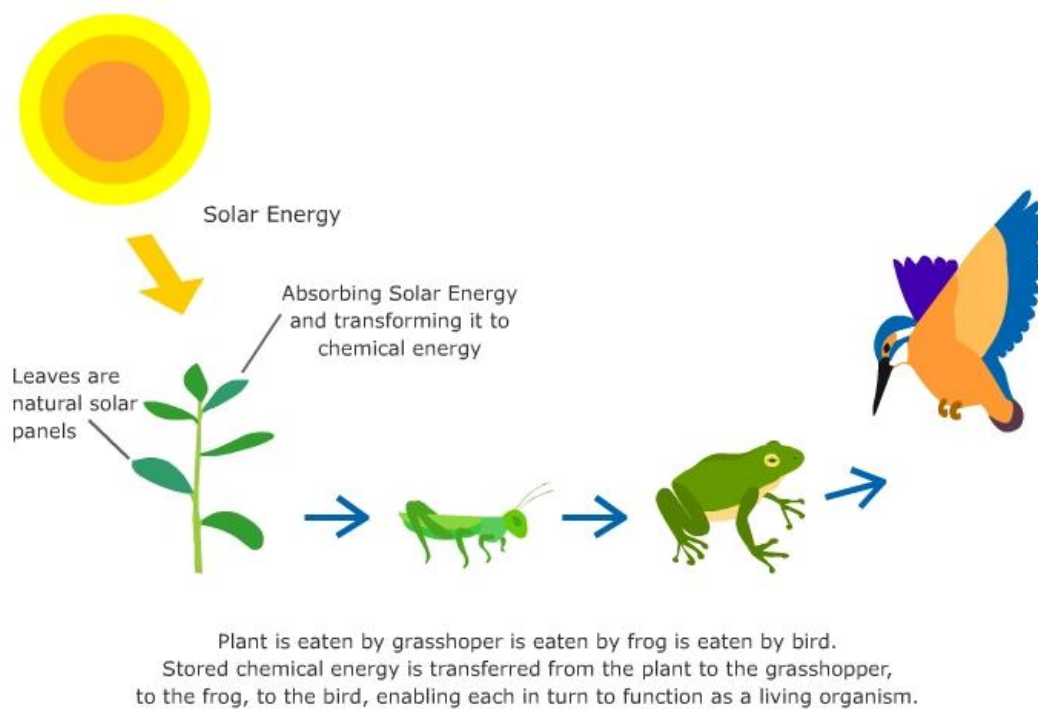
<http://www.brainpop.com/science/energy/energypyramid/>

## **Food chain**

a single pathway of feeding relationships among organisms in an ecosystem

Results in energy transfer

Feeding relationships in an ecosystem are usually too complex to be represented by a single food chain



<http://www.brainpop.com/science/ecologyandbehavior/foodchains/>

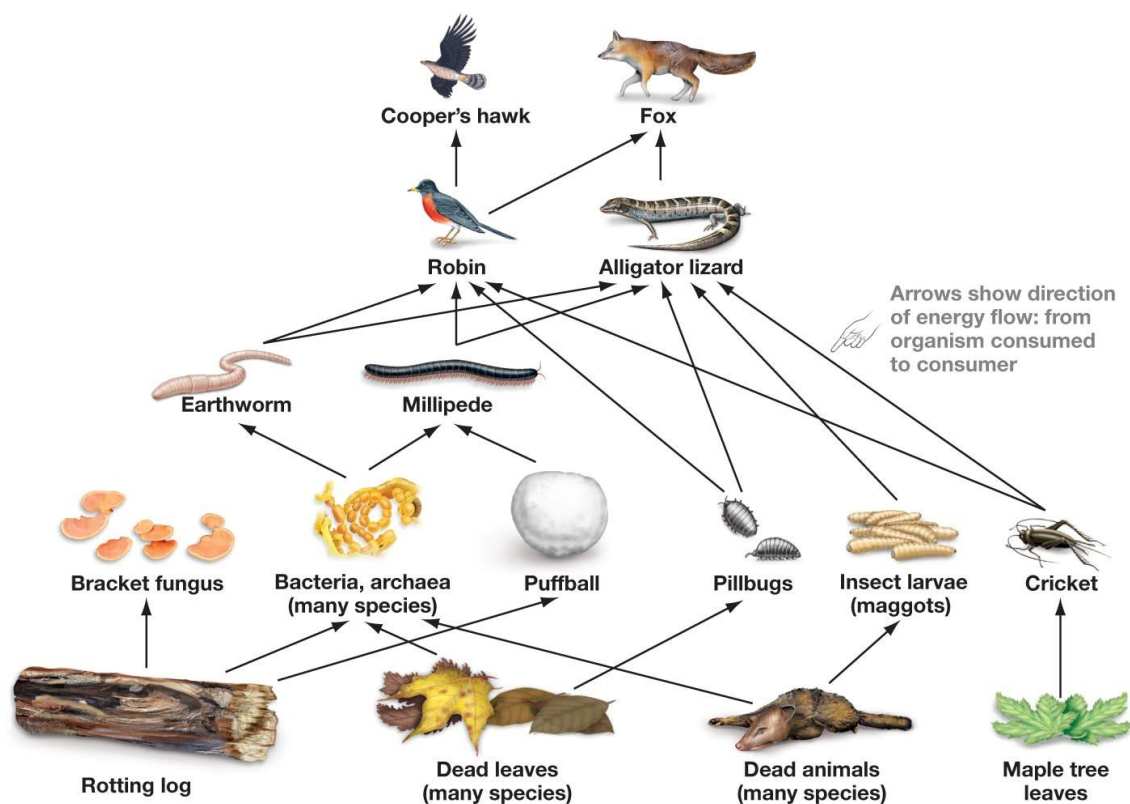
## Food web

interrelated food chains in an ecosystem

Energy transfer

10% of the energy consumed in one trophic level is incorporated into the organisms in the next level

Low rate of energy transfer = only a few trophic levels in most ecosystems



Usually more organisms at the bottom level than the top

Less energy at the top means  
fewer organisms can be supported